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AUTHOR Rever, Philip R.; Kojaku, Lawrence K.
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ABSTRACT

This study contrasts the distributions of indices of academic abilities and achievements of entering freshmen classes and of classes that were intact at the end of the first year of college over an eight-year period. The data reported are based on two groups of students, one comprised of all students who completed the American College Test (ACT) Assessment Program and subsequently enrolled in college, and the other group comprised of all students in the first group completing their first year of college. Data collected show a decline in ACT test scores, an increase in the high school grades of college entrants, and the stability of test scores and increases in college grades of freshmen completing their first year of college. (Author)

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Access, Attrition, Test Scores and Grades of College Entrants and Persisters: 1965-1973

Philip R. Rever and Lawrence K. Kojaku

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TM 004 734

The American College Testing Program
P. O. Box 168
Iowa City, Iowa 52240

Abstract

This study contrasts the distributions of indices of academic abilities and achievements of entering freshmen classes and of classes that were intact at the end of the first year of college over an eight-year period. The data reported are based on two groups of students one comprised of all students who completed the ACT Assessment Program and subsequently enrolled in college and the other group comprised of all students in the first group completing their first year of college. Data collected show a decline in ACT test scores, an increase in the high school grades of college entrants, and the stability of test scores and increases in college grades of freshmen completing their first year of college.

Access, Attrition, Test Scores and Grades of College Entrants and Persisters: 1965-1973[1]

Philip R. Rever
The American College Testing Program

Lawrence K. Kojaku
New York University

The period between the mid-1960s and the early 1970s was a time of remarkable change and turmoil in American higher education. Institutions of higher education were coping with civil rights and antiwar demonstrations and at the same time trying to respond to equally pressing calls for expanding individual educational opportunity. New community and junior colleges were being rapidly established and older ones expanded. "Open admissions" policies were being adopted and universities were admitting larger and larger freshman classes. Federal and state financial assistance programs were established and expanded to remove cost as a barrier to postsecondary education. The purpose of these new institutions, admissions policies, and financial aid programs was to enable students from backgrounds traditionally underrepresented in higher education to obtain a postsecondary education.

This effort to make postsecondary education available to greater numbers of students with diverse backgrounds had many implications for institutions of higher education. Cross (1971) suggested that a particularly significant effect was the introduction of a "new" type of student to higher education, the student coming from the lower third of his high school graduating class.

Actually, a few recent studies suggest that the trend toward greater diversity in students admitted to college was underway before the 1970s.

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[1]Presented at the American Association of Collegiate Registrars and Admissions Officers National Conference, Minneapolis, Minnesota, April, 1975.

For example, Fenske and Scott (1974) reported that average high school grades of college freshmen increased between 1968 and 1972 while average college admissions test scores declined slightly. In 1974, The American College Testing Program (Ferguson & Maxey, 1975) reported a 10-year decline in the average test scores of students completing the Assessment Program's test battery. In contrast, an earlier study (Baird & Feister, 1972) reported that the average test scores and college grades of students who completed their first year in college between 1964 and 1968 tended to remain fairly stable. Thus, in recent years there is some evidence to suggest that successive entering college classes have had lower average test scores and higher average high school grades than preceding classes. At the same time indices of academic ability and achievement have tended to be stable for successive groups of students completing their first year in college. A confounding factor in the outcomes reported above is that the two studies were conducted for different years, thus making it difficult to generalize findings across the entire time span. The purpose of this study was to investigate changes in the distributions of indices of academic abilities and achievements of entering freshmen classes and of classes that were intact at the end of the first year of college and to do it over comparable time spans.

Method

The data reported in this study were gathered from the Research Services files of The American College Testing Program (ACT). First established in the fall of 1965, these files contain information about each subsequent year's college entrants and groups of students who completed

their first year of college each spring since 1966. For clarity, the latter group is referred to as "first year persisters" throughout the remainder of this paper.

College entrants. Each fall since 1965, ACT has prepared profiles of college freshmen classes for those institutions that require or recommend that prospective students complete the ACT Assessment. These profiles, called Class Profiles, consist of summaries of student data collected through the Assessment. These data include five test scores and student reported high school grades (Maxey & Ormsby, 1971). The test scores are the English Usage Test score, the Mathematics Usage Test score, the Social Studies Reading Test score, the Natural Sciences Reading Test score, and the Composite (ACT-C) score which is the arithmetic average of the other four scores. The scores range from 1 to 36, have a mean of about 19, and have a standard deviation of about 6. ACT summarizes these data for the freshmen classes at a large number of institutions each fall and provides the summaries to the institutions. In 1965, over 500 colleges received summary data about their entering classes and in 1972 over 1200 colleges received a summary. The data used in this study for entering students were gathered from the 1965 and 1972 reports.

Persisters. ACT's Research Service files also contain data about a large portion of the nation's students who successfully complete the first year of college. These data are collected when ACT conducts its annual predictive validity studies for institutions interested in determining the relationships among assessment scores, high school grades and first year

college grades. In 1966, 376 institutions elected to report the grades of students who completed their first year in college in the spring of 1966. Eight years later, 761 institutions reported the grades of students who completed their first year in the spring of 1973. Thus, ACT's Research Service files contain the ACT-C scores and college grades of persisters in 1966 and 1973. The data used for first year persisting students in this study were gathered from these files.

Samples

Two matched institutional samples were used in this study. The first sample was based on colleges represented in the entrants files. All institutions for which data were available in both 1965 and 1972 were included in one sample (N=426). The second sample, a subset of the first, was based on institutions in the persisters' files. All institutions that reported first year college grades of persisters in both 1966 and 1973 were included in the second sample (N=281).

Institutions in both samples were classified according to the highest degree offered (The Education Directory; Part III: Higher Education, 1965, 1972). Definitions of the classification scheme are shown below:

Type 1	Two year but less than 4 year degrees, includes junior colleges, technical institutions, and normal schools.
Type 2	Only bachelor's degree and/or first professional degree (BA, BS, and MD, DDS, and so on).
Type 3	Masters and/or second professional degree (MA, MEd, MBA, etc).
Type 4	Doctor of Philosophy or equivalent degree.
Changed	U.S.O.E. level designation changed between 1965 and 1972.

Use was made of the preceding classification scheme in the analyses described below.

Analyses

Differences in the distributions between years were determined by comparing means and standard deviations of test scores and grades of entrants and first-year persisters. The means and standard deviations of entrants' ACT-C's and high school averages (H.S.A.'s) were gathered from ACT's entrants files. This resulted in distributions of means and standard deviations for fall 1965 and fall 1972 entrants for each level of institution. The means of the distributions of means and standard deviations were compared within levels using the t test for related samples.

Similarily, the means and standard deviations of first-year persisters ACT-C's and first-year college grade point averages (G.P.A.'s) were gathered from ACT's persisters' files. The means of these means and standard deviations were also compared within levels of institutions using the t test for related samples.

Results

The results of those comparisons are contained in this section. Differences in the distributions of ACT-C and HSA's of college entrants are discussed first.

Entrants

Table 1 contains the means of HSA's means and means of HSA standard deviations by level of institutions. According to the data in

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Insert Table 1 About Here

Table 1, the distributions of HSA's among entrants at 426 institutions were significantly higher in 1972 than 1965 for all types of institutions. Moreover, significant differences between mean HSA standard deviations were found at 3 of 5 types of institutions. Consequently, it can be said that the distributions of HSA's for 1965 and 1972 were different. Entering classes in 1972 had significantly higher average HSA's and smaller deviations than did classes in 1965.

Significant differences were also found in the distributions of ACT-C for entrants in 1965 and entrants in 1973 as shown in Table 2. Specifically,

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Insert Table 2 About Here

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the distributions were more variable in 1973 than in 1965, and the means of the ACT-C means were significantly different. Thus, there appears to be a small downward shift in the distributions, and there has been a significant increase in variability.

First-Year Persisters

Table 3 contains data on the distributions of GPA's among persisters. Significant differences between the means of GPA means over the defined time span were found at all five types of colleges. Differences between

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Insert Table 3 About Here

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mean GPA standard deviations were found at two of the five types of institutions. Thus, it seems that there has been a definite upward shift in average GPA of first-year persisters. At the same time, changes in the shape of the GPA distributions are mixed.

The distributions of ACT-C means and standard deviations of first year persisters are summarized in Table 4.

Insert Table 4 About Here

The mean of the ACT-C means of persisters was not significantly lower in 1972 than in 1965. However, the mean ACT-C standard deviation was larger in 1972 than 1965.

Discussion

College Entrants

Test scores. This study's finding that there was a decline in the average admissions test scores of entering college freshmen substantiates earlier reports (American College Testing Program, 1974; Hawes, 1972) that colleges are enrolling entering classes with significantly greater diversity in academic abilities than in years past, and gives rise to a series of hypotheses for further investigation. Perhaps the decline can be explained by the introduction of Cross's (1971) "new" students, as described by the president of the Educational Testing Service, William W. Turnbull (Hawes, 1972).

> I think the reason is mainly that a much larger slice of each age group now goes to college. A generation ago, the matriculants represented a more select subgroup: most of the very high-scoring students, a goodly number of the above-average, and not many of those below the median. As the percentage of those seeking higher education has risen, much of the increase has of necessity come from the middle and lower parts of the scale, driving down the average.

This study's finding suggests that the financial aid programs, opportunity programs, open admissions programs, etc. of the last decade successfully

increased access for students with backgrounds traditionally underrepresented in higher education. However, other evidence related to this tentative conclusion should be gathered and analyzed. Differences in parental income, level of aspiration, locale of parental residence, and race and ethnic background of entering students in different years should be investigated. Alternative hypotheses should also be researched. Perhaps the content of the ACT Assessment (The American College Testing Program, 1973) no longer accurately reflects the content of the academic curriculum in secondary schools. Perhaps the decline is related to changes in student attitudes toward college admissions and placement tests. Perhaps the decline is related to changes in instructional methods. The plausible hypotheses explaining the decline are legion, but this study suggests that in order to understand the decline in average tested academic ability of college entrants, future investigation should first focus on changes in the demographic characteristics of college entrants over the past decade.

Grades. Another significant set of findings were the differences in average high school grades and average variability between 1965 and 1972 college entrants. The increase in average high school grades of college freshmen does not necessarily mean that students are performing better in high school today than their counterparts of a decade ago. Moreover, it is difficult to reconcile the rise in average high school grades of entrants with the decline in average standardized test scores. If high school grading patterns had not changed between 1965 and 1972 and if "new" students were indeed entering higher education, average high school grades would have

declined as average test scores declined. Thus, if more "new" students were in fact entering colleges and universities, the change in average high school grades is a conservative indicator of a change in high school grading patterns. Dropping the grades of "new" students from the distributions would likely remove grades below the mean, resulting in an even greater difference between the two years than was observed in this study.

First-Year Persisters

Grades. A parallel can be drawn between the increase in average high school grades and the increase in average college grades of first-year persisters. Grades in both high school and college have a higher mean today than a decade ago. A study of 435 colleges and universities by Burwen (1971) reported that undergraduate grades had risen significantly during the 1960s. The merits of current grading practices can be and are discussed continually (e.g., see Hoyt, 1970; Newsweek, 1974; Trow, 1968; White, 1975).

If positive rewards are more effective motivating factors for future desired behavior than negative rewards, then higher grades may be desirable because they promote future learning behavior. Of course, it is equally plausible that average higher grades do not encourage learning, but lead to less learning, since competition for grades may promote learning. It could also be said that higher, more homogeneous grades are a disservice to students because evaluation of performance in the real world (e.g., job salaries, promotions, etc.) is not usually so consistently positive. Unless students experience appropriate negative rewards, they may have difficulty

adjusting to negative rewards after leaving the protective environment of educational institutions. However, it is clear that many students receiving consistently positive rewards (i.e., high grades) in college receive negative rewards in their subsequent occupation, and that many students who consistently receive negative rewards (i.e., low grades) in college receive consistently positive rewards in their occupation (Calhoon & Reddy, 1968; Heckman, Banas, Lazenby, & Moore, 1969; Hoyt, 1970; Munday & Davis, 1974). Hence, the view of higher grades as a disservice may not be appropriate. Regardless, higher grades are the order of the day.

Test scores. Despite the importance of the findings discussed above, perhaps the most important finding was the lack of uniform significant differences over time in test scores of students who completed their freshman year of college. Since the test scores of entering groups of students have declined and the scores of first-year persisting groups have remained stable over comparable periods of time, attrition must account for the stability at the point of exit. Thus, the data clearly suggest the tendency for lower-scoring students not to complete the first year of college.

Perhaps poor grades account for attrition. The effects of attrition may be to leave only students with higher grades in college, thus resulting in higher and more homogeneous average grades. On the other hand, the magnitude of the increase in college grades suggests that academic difficulties may not entirely account for the attrition of students with lower test scores. If these students are, as Cross suggests, "new" students, perhaps they are leaving college in greater proportion than higher scoring

students. If so, the implication is that the emphasis on increased accessilibity to college, which may have been successful as evidenced by lower average test scores of entrants, was not matched by the provision of programs and environments compatible with the needs and educational development of "new" students. Astin, et. al. (1972) concluded that although special support programs were successful in helping "new" students, the programs studied involved a small proportion (estimated at 2.6%) of all undergraduates at her sample institutions. Perhaps if more "new" students were able to participate in special support programs, they would remain in college and their test scores would be reflected in a decline in average admission test scores of first-year persisters. Nonetheless, whether or not increased access during the last decade was accompanied by increased attrition during the first year in college requires further study.

Another implication of this finding is that academic ability test measures are related to persistence in college. If such measures were unrelated, significant differences in first-year persisters' test scores between years studied would have been found.

There is, however, an optimistic note to add to the discussion of the findings. The average variance of test scores of first-year persisters in 1973 was larger than in 1965, suggesting that more lower-scoring students are completing their first year of college than before. Unfortunately, there were apparently too few who survived their first year in college to reduce the 1973 average test score of first-year persisters.

Although the results of this study have serious implications for higher education, the limitations of this study suggest a need for more detailed

investigations before definitive conclusions can be reached. These limitations include the use of data for only two years, which did not allow the tracing of trends. In addition, changes in distributions of student characteristics other than test scores and high school grades need to be investigated. Moreover, because unweighted statistics were used in the data analysis, entering class size was not reflected in the data. Despite these limitations, the tentative conclusions of this study clearly suggest the need for additional research.

The topics discussed in this paper are admittedly complex. Perhaps by documenting the decline in test scores and increases in high school grades of college entrants, and the stability of test scores and increases in college grades of freshmen completing their first year, more study of changes in indices of ability and achievement over time will be encouraged.

TABLE 1

MEANS OF HSA MEANS AND STANDARD DEVIATIONS OF COLLEGE FRESHMEN IN 1965 AND 1972

		MEANS			STANDARD DEVIATIONS		
	N	1965	1972	t	1965	1972	t
USOE LEVEL							
1	143	2.43	2.64	14.19**	.64	63	-1.65
2	118	2.64	2.79	9.08**	.66	.65	-2.06*
3	69	2.65	2.82	9.86**	.66	.64	-3.51**
4	46	2.75	2.92	8.78**	.66	.62	-5.83**
Changed	50	2.65	2.83	8.83**	.66	.65	-1.43

*$p<.05$

**$p<.01$

TABLE 2

MEANS OF ACT-C MEANS AND STANDARD DEVIATIONS OF COLLEGE FRESHMEN IN 1965 AND 1972

		MEANS			STANDARD DEVIATIONS		
	N	1965	1972	t	1965	1972	t
USOE LEVEL							
1	143	18.50	17.96	-4.01**	4.31	4.83	12.05**
2	118	20.04	19.67	-3.30**	4.18	4.86	13.13**
3	69	19.89	19.40	-2.93**	4.18	4.84	10.20**
4	46	21.90	21.43	-3.19**	4.15	4.80	8.33**
Changed	50	20.61	20.30	-1.59	4.20	4.82	9.28**

**$p < .01$

TABLE 3

MEANS OF OVERALL COLLEGE FRESHMEN GPA MEANS AND STANDARD DEVIATIONS IN 1966 AND 1973

		MEANS			STANDARD DEVIATIONS		
	N	1966	1973	t	1966	1973	t
USOE LEVEL							
1	91	2.08	2.54	16.60**	.80	.78	-1.14
2	76	2.24	2.52	10.87**	.72	.77	3.87**
3	44	2.14	2.49	10.84**	.74	.79	2.67*
4	29	2.14	2.49	10.02**	.79	.78	-.10
Changed	41	2.13	2.44	10.91**	.82	.82	0.00

*$p<.05$

**$p<.01$

TABLE 4

MEAN OF ACT-C MEANS AND STANDARD DEVIATIONS OF FRESHMEN WHO COMPLETED THEIR FIRST YEAR IN COLLEGE IN 1966 AND 1973

	N	MEANS			STANDARD DEVIATIONS		
		1966	1973	t	1966	1973	t
USOE LEVEL							
1	91	18.40	18.26	-1.03	4.46	4.88	9.16**
2	76	20.01	20.04	.24	4.25	4.93	12.17**
3	44	19.81	19.70	-.85	4.12	4.78	9.36**
4	29	22.11	21.86	-1.36	4.04	4.65	7.24**
Changed	41	20.01	19.78	-.91	4.33	4.87	6.53**

**$p < .01$

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